

We claim:

1. In a mobile device having a profile table that relates a plurality of battery profile values with a plurality of operating parameter values, a method of determining a capacity of a battery using the profile table, comprising:

measuring an operating parameter of the battery;  
accessing the profile table to translate the measured operating parameter into a battery profile value;  
adjusting the battery profile value by a correction factor to generate a corrected battery profile value;  
calculating the capacity of the battery using the corrected battery profile value;  
using the measured operating parameter to estimate an actual battery profile value; and  
automatically calibrating the correction factor using the estimated actual battery profile value.

2. The method of claim 1, wherein the operating parameter is a battery temperature.

3. The method of claim 1, wherein the operating parameter is a battery current.

4. The method of claim 1, wherein the operating parameter is a transmit power of a mobile communication device that is powered by the battery.

5. The method of claim 1, wherein the battery profile value is an equivalent series resistance (ESR) of the battery.

6. The method of claim 1, wherein the battery profile value is a battery capacity value.

7. The method of claim 1, wherein the battery profile value is a battery current.

8. The method of claim 1, wherein the profile table relates a plurality of correction factor values to the plurality of operating parameter values, further comprising:

accessing the profile table to translate the measured operating parameter into the correction factor.

9. The method of claim 1, wherein the profile table relates a plurality of battery capacity values with a plurality of voltage values, further comprising:

calculating a voltage value as a function of the corrected battery profile value;

accessing the profile table to translate the calculated voltage value into a battery capacity value; and

calculating the available capacity of the battery as a function of the battery capacity value.

10. The method of claim 9, further comprising:

adjusting the battery capacity value by a capacity correction factor to generate a corrected capacity value, wherein the capacity of the battery is calculated as a function of the corrected capacity value.

11. The method of claim 10, further comprising:

using the measured operating parameter to calculate a battery capacity change;

determining a change in the battery capacity value; and

automatically calibrating the capacity correction factor using the calculated battery capacity change and the determined change in the battery capacity value.

12. A method of estimating an operating time for a predetermined function of a device having a battery, the predetermined function relying on the battery to operate for the duration of the operating time, comprising:

- determining an accessible capacity value for the battery;
- determining a load value for the predetermined function; and
- determining the operating time value as a function of the load value and the accessible capacity value.

13. The method of claim 12, further comprising:

- determining an unloaded voltage value for the battery.

14. The method of claim 13, further comprising:

- determining an equivalent series resistance value for the battery;
- determining a load voltage value for the battery;
- determining a load current value for the battery;
- determining the unloaded voltage value as a function of the equivalent series resistance value, the load voltage value, and the load current value.

15. The method of claim 14, wherein the device is a communication device.

16. The method of claim 15, wherein the predetermined function is a wireless communication.

17. The method of claim 14, wherein the predetermined function is charging the battery.

18. The method of claim 12, further comprising:

- detecting that the operating time value has reached a predetermined threshold value;

and

triggering a predetermined action in response to detecting that the operating time value has reached the predetermined threshold value.

19. The method of claim 18, wherein the predetermined action is transmitting a warning message to a user of the device.

20. The method of claim 12, further comprising:

displaying the accessible capacity value.

21. The method of claim 12, further comprising:

displaying the operating time value.

22. A mobile device, comprising:

a memory device;

a battery;

a profile table stored in the memory device that relates a plurality of battery profile values with a plurality of operating parameter values;

means for measuring an operating parameter of the battery;

means for accessing the profile table to translate the measured operating parameter into a battery profile value;

means for adjusting the battery profile value by a correction factor to generate a corrected battery profile value;

means for calculating the capacity of the battery using the corrected battery profile value;

means for using the measured operating parameter to estimate an actual battery profile value; and

means for automatically calibrating the correction factor using the estimated actual battery profile value.